

PRECAST PRESTRESSED BOX BEAMS

General Notes

SPECIFICATIONS: All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO Standard Specifications for Highway Bridges, with Interims.

DESIGN LOADS: Beam sections are designed for HS25 live load or alternate loading of two 24-kip axles spaced at 4 ft. apart, whichever produces the greater stress. The HS25 live load is arrived by increasing the standard HS20-44 truck and lane loads as specified in the AASHTO Specifications by 25 percent.

MATERIAL DESIGN SPECIFICATIONS:

for Steel Reinforcement	FY = 60000 PSI
for Prestressed Girder Concrete	F'C = 5800 PSI
	F'CI = 4500 PSI
for Prestressing Steel	F'S = 270000 PSI

DESIGN LENGTH: Beam lengths shown in the Standards represent total beam length. Beams are designed for spans from centerline of bearing to centerline of bearing. Use the next greater designed section for non-Standard lengths.

CONSTRUCTION METHOD: Transferring bond stress to the concrete will not be allowed, nor releasing of end anchors until the concrete has attained a minimum compressive strength of 4500 PSI as shown by standard cylinders made and cured identically with the girders; attain 5800 PSI at or prior to 28 days. Apply an initial prestress force of 28000 lbs. per low relaxation strand. Beams with honeycomb of such extent as to affect the strength or resistance to deterioration will not be accepted. The allowance of .0005L (length) is made for shortening of beams due to shrinkage and elastic change. Furnish shop plans showing a detensioning plan by numbering, in sequence, the strand pattern.

PRESTRESSING STRANDS: Ensure prestressing strands to be 1/2", Grade 270 low-relaxation strands conforming to AASHTO M 203. If an alternate strand arrangement or strand type is preferred by the Contractor, the designer that developed the original plans will provide the design and also revise the original plans to reflect the changes. These design and plan modifications will be done at the Contractor's expense.

CORROSION INHIBITOR: Provide a corrosion inhibitor for B-type (non-composite) beams in accordance with the current Special Note for Corrosion Inhibitors.

BEVELED EDGES: Bevel all exposed edges 3/4".

REINFORCEMENT: Dimensions shown from the face of concrete to reinforcement are clear distances. Spacing of reinforcement is from center to center of reinforcement. All steel reinforcement is to be epoxy coated in accordance with Section 811.10 of the Specifications. Consider bars marked 'C' to be a stirrup for purposes of bend diameters. Non-epoxy reinforcement may be used for fabrication purposes, only, provided that the steel is not used in the top 5/2' of the beam and the location of the steel is indicated on the shop drawings.

FABRICATION: Beams shall not be fabricated more than 120 days before the deck is to be poured.

CURBS: Pour curbs on B-type beams in the plant. Concrete must have the same mix design as the beam section, except that the cylinder strength need not exceed that for Class 'AA' Concrete. Include the cost of the curbs in the price of beam.

GROUT: Provide non-shrink grout for anchor dowels, shear keys, and tensioning rod block-outs conforming with Section 601.03.03 of the Specifications. When side by side superstructure is utilized, grouting will be completed after lateral tension rods have been fully tightened and before leveling devices have been removed. Include the cost of furnishing and placing grout in the price of beam.

RAILING SYSTEM TYPE II: Furnish this material per these specifications.

ITEM	DESCRIPTION	MATERIAL SPECIFICATION	COATING SPECIFICATION
Post	W6x25	ASTM A36	A123
Channel	C7x9.8	ASTM A36	A123
Plate	1/2" x 7"	ASTM A36	A123
Tubing	8x4x0.1875	ASTM A500 or A501	A123
Bolts	3/4"	ASTM A307	A153
Nuts	for 3/4"	ASTM A563, Grade A or better	A153
Washers	for 3/4"	ASTM A563, Grade A or better	A153
Stud	1 1/4"	ASTM A108 (1045 C.D. Bar)	B633, Type II, Class 25
Ferrule	2 1/2" x 5"	ASTM A108 (11L17 Steel)	B633, Type II, Class 25
Wire	3/8"	ASTM A510 (1018 Steel)	B633, Type II, Class 25
Nut	for 1 1/4" Bolt	ASTM A108 (12L14 Steel)	B633, Type II, Class 25
Nut	for 1 1/4" Stud	ASTM A325M	B633, Type II, Class 25
Washers	for 1 1/4" Stud	ASTM A325M	B633, Type II, Class 25

Use the current edition of the references listed below with these standards.

STANDARD DRAWINGS

BBP-003	Elastomeric Bearing Pads
BHS-007	Railing System Type II
BJE-001	Armored Edge & Neoprene Joints
RBR-001	Steel Beam Guardrail
RBR-005	Guardrail Components

SPECIAL NOTES

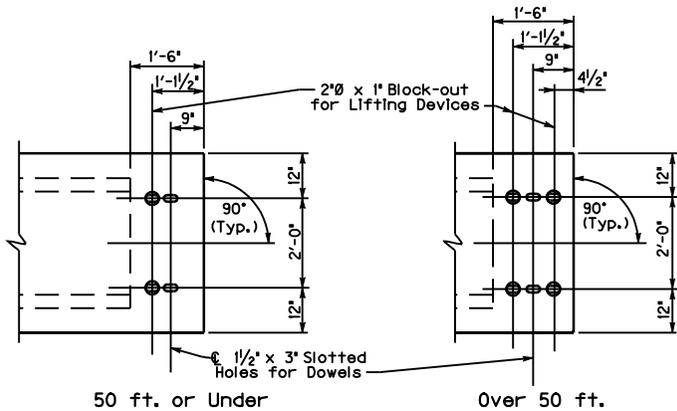
for Corrosion Inhibitors

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

**BOX BEAM
GENERAL NOTES
& REFERENCES**

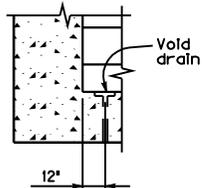
STANDARD DRAWING NO. BDP-001-03

SUBMITTED	<i>[Signature]</i>	11-21-07
	DIRECTOR DIVISION OF BRIDGE DESIGN	DATE
APPROVED	<i>[Signature]</i>	11-21-07
	STATE HIGHWAY ENGINEER	DATE



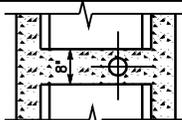
TYPICAL STRAIGHT END

NOTE: Void omitted on 12' beams.



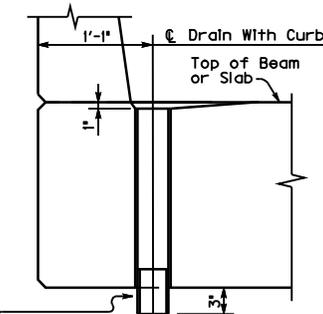
VOID DRAIN DETAIL

Locate two drains at each end of each void. Provide 1"Ø drains of a type approved by the Division of Materials.

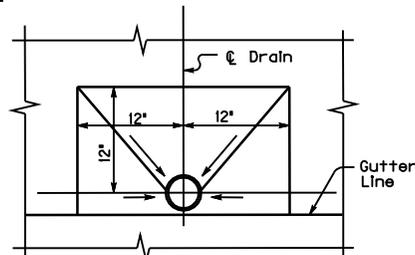


SECTION THRU BEAM

Diaphragms may be omitted if void is cut to allow drain to be encased with a minimum 2" of concrete.



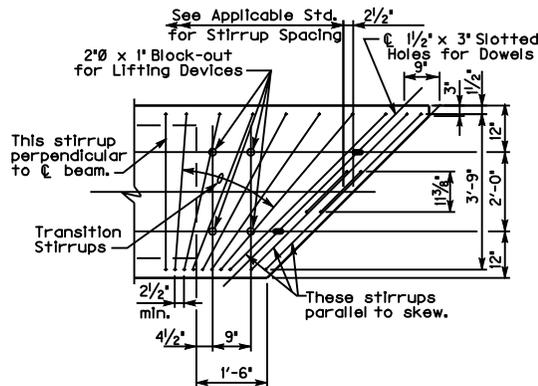
Provide drains on both sides of bridge with normal crown and on low side only for superelevated bridges. Space drains at maximum 12'-6" on centers with a minimum of one placed each gutter line per span. Omit drains when span crosses over a highway or railroad. Include the cost of pipe and fittings in the price of beam.



TOP VIEW OF DRAIN

DRAIN DETAILS

(For Spans With Curbs)

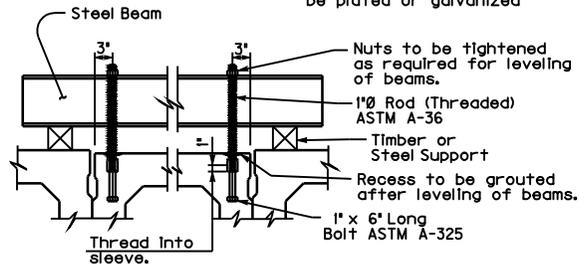


TYPICAL SKEWED END FOR BEAMS OVER 50 FEET

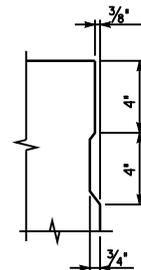
(Right Skew Shown, Left Opposite Hand)

SECTION THRU DRAIN EXTERIOR BOX BEAM
(Showing coupling in barrier)

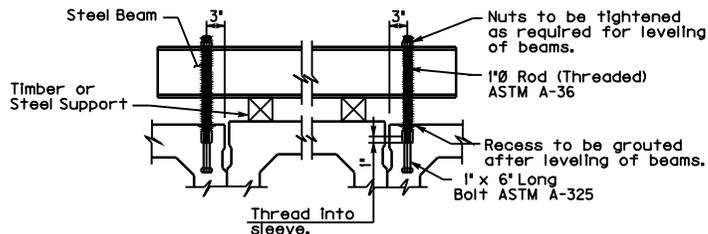
Note: Inserts are to be plated or galvanized



NOTE: Omit shear key on exterior face of exterior beam.

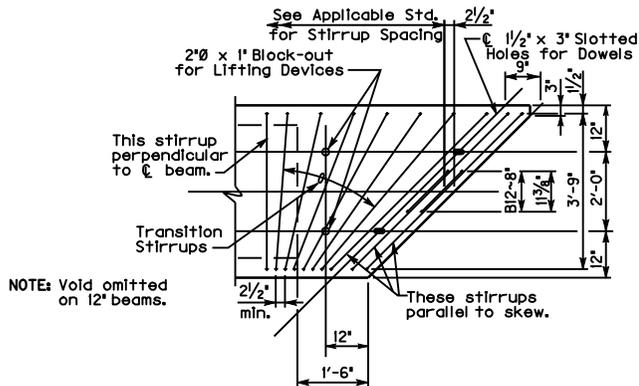


SHEAR KEY DETAIL



LEVELING DEVICE DETAILS

Locate inserts at the center of beams up to 50 ft. and at diaphragm locations of beams over 50 ft. Include the cost of materials and labor involved in leveling beams in the price for beams. Submit alternate leveling devices to the Division of Bridge Design for approval.

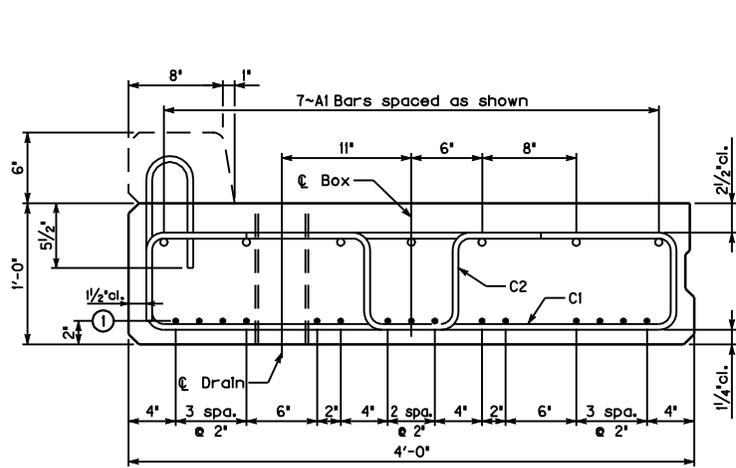


TYPICAL SKEWED END FOR BEAMS 50 FEET OR LESS

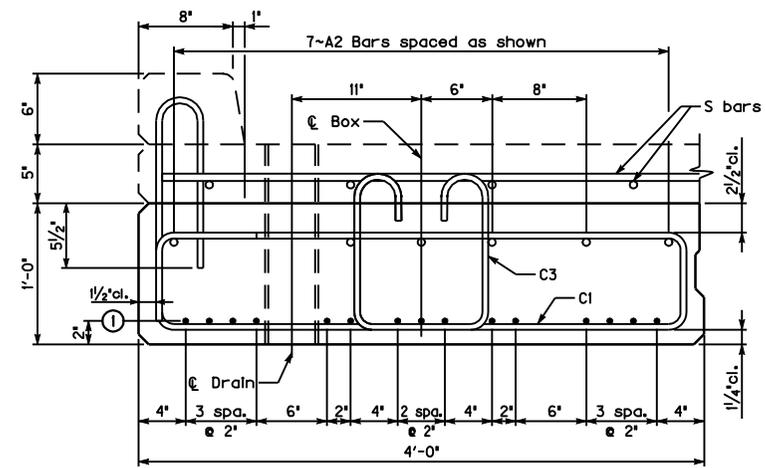
(Right Skew Shown, Left Opposite Hand)

NOTE: Void omitted on 12' beams.

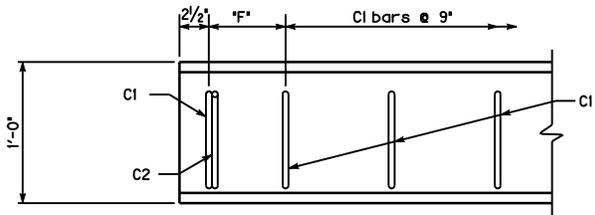
KENTUCKY DEPARTMENT OF HIGHWAYS		
BOX BEAM MISCELLANEOUS DETAILS		
STANDARD DRAWING NO. BDP-003-03		
SUBMITTED	<i>W. Frank</i> DIRECTOR DIVISION OF BRIDGE DESIGN	11-21-07 DATE
APPROVED	<i>M. [Signature]</i> STATE HIGHWAY ENGINEER	11-21-07 DATE



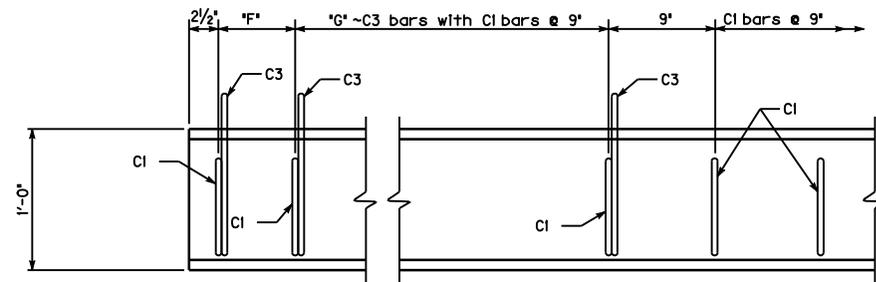
B12 BEAM



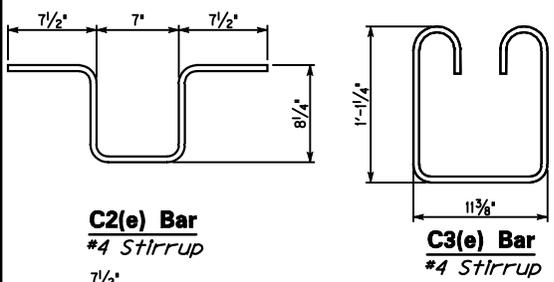
CB12 BEAM



B12 ELEVATION OF 0° SKEW
(Refer to BDP-003, for skewed details)

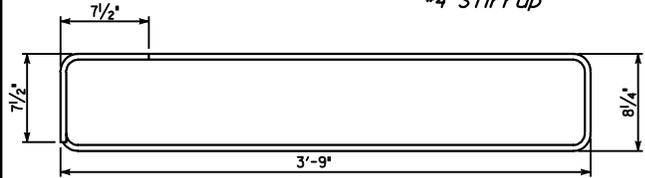


CB12 ELEVATION OF 0° SKEW
(Refer to BDP-003, for skewed details)

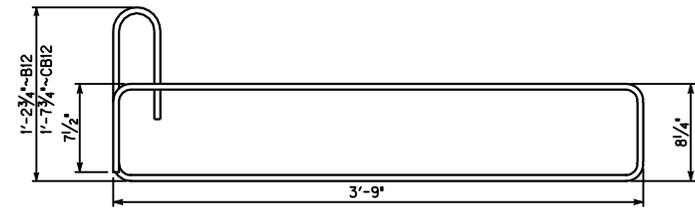


C2(e) Bar
#4 Stirrup

C3(e) Bar
#4 Stirrup



C1(e) Bar
#4 Stirrup



C1(e) Bar - #4 Stirrup
for Exterior Beam, Only

TABLE OF DESIGN DATA

Beam Type	Beam Length (feet)	Number of Strands Required	
		Row ①	
B12	12	9	
	14	9	
	16	10	
	18	11	
	20	12	
	22	13	
CB12	24	13	
	26	14	
	12	6	
	14	7	
	16	7	
	18	8	
	20	8	
	22	9	
	24	10	
	26	12	
28	13		
30	12		
32	13		
34	15		

TABLE OF DIMENSION DATA

Beam Type	Beam Length (feet)	"F"	"G"			
B12	12	6 1/2'				
	14	5'				
	16	8'				
	18	6 1/2'				
	20	5'				
	22	8'				
CB12	24	6 1/2'				
	26	5'				
	12	6 1/2'	3			
	14	5'	3			
	16	8'	4			
	18	6 1/2'	4			
	20	5'	5			
	22	8'	6			
	24	6 1/2'	6			
	26	5'	8			
28	8'	9				
30	6 1/2'	10				
32	5'	12				
34	8'	13				

Straight Reinforcement

MARK	SIZE	LENGTH
A1(E)	#5	Beam Length Minus 3'
A2(E)	#4	Beam Length Minus 3'
D(E)	#8	2'-0"

KENTUCKY DEPARTMENT OF HIGHWAYS

**BOX BEAM
B12 & CB12
DETAILS**

STANDARD DRAWING NO. BDP-006-03

SUBMITTED *[Signature]* DATE 11-21-07
 APPROVED *[Signature]* DATE 11-21-07
 DIRECTOR DIVISION OF BRIDGE DESIGN
 SLATE HIGHWAY ENGINEER

General Notes

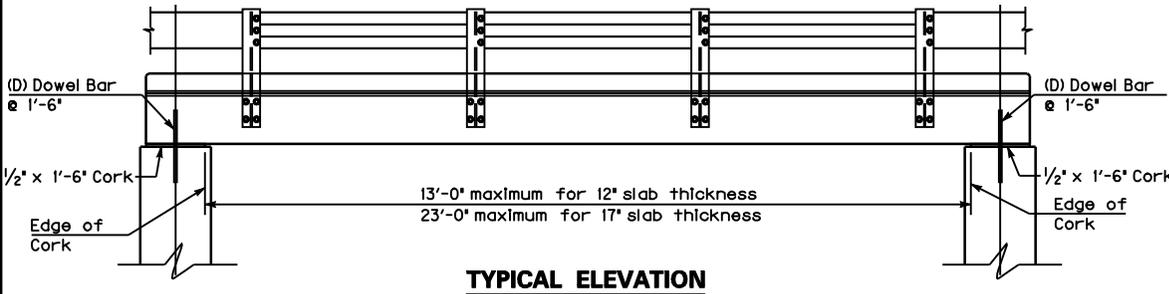
SLAB OPTION: The superstructure option shown on this Standard Drawing may be used in lieu of composite or non-composite adjacent box beams. Notify the Director of the Division of Bridge Design when this option is used.

CLASS 'AA' REINFORCED CONCRETE: All falsework is to remain in place until the Class 'AA' Concrete compressive strength is 4000 PSI. Class 'AA' Concrete is to be used throughout the superstructure.

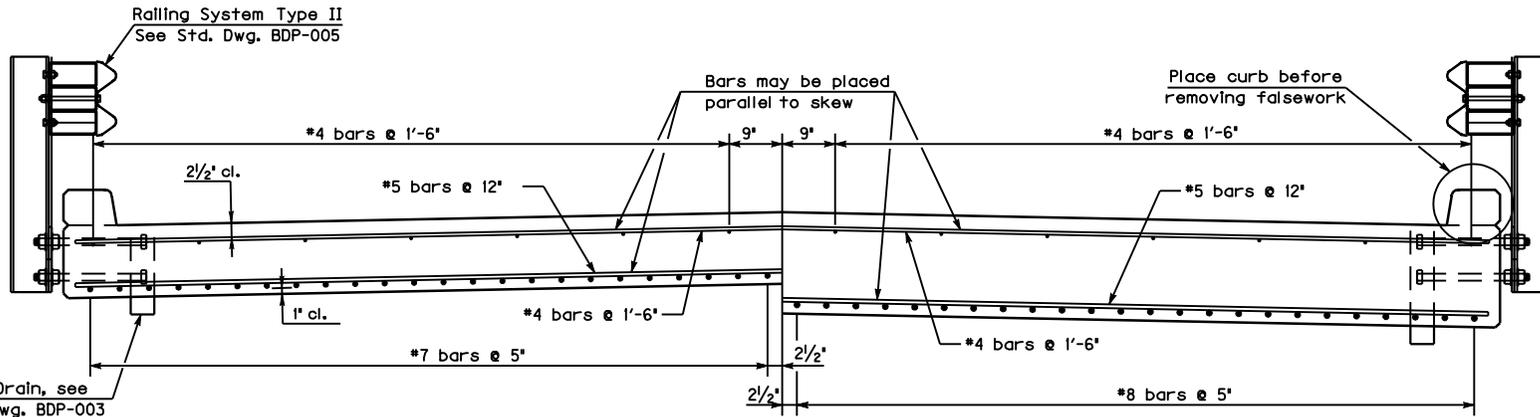
ELEVATIONS: Determine final elevations using the elevations, slopes, and grades shown on the detailed plans.

STEEL REINFORCEMENT: Ensure steel reinforcement is ASTM A 615 Grade 60 and epoxy coated.

SURFACE FINISH: The top of the slab surface may be finished with a floated surface finish in accordance with Section 601.03.18 and textured in accordance with Section 609.03.11.



TYPICAL ELEVATION



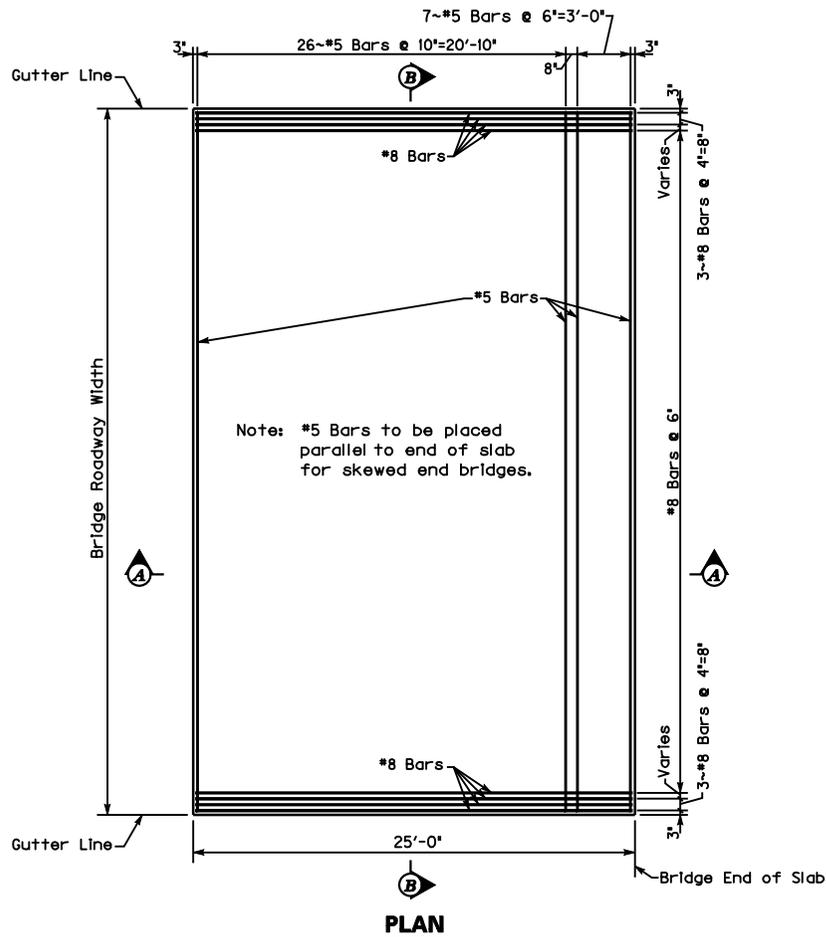
Half-Section showing 12" Slab

Half-Section showing 17" Slab

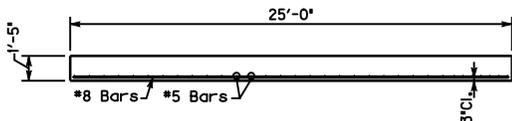
TYPICAL SECTION OF CAST-IN-PLACE SLAB

KENTUCKY DEPARTMENT OF HIGHWAYS		
SLAB BRIDGE FOR 12" & 17" BEAMS		
STANDARD DRAWING NO. BDP-013-01		
SUBMITTED	<i>W. Frank</i> DIRECTOR, DIVISION OF BRIDGE DESIGN	11-21-07 DATE
APPROVED	<i>Markus Johnson</i> STATE HIGHWAY ENGINEER	11-21-07 DATE

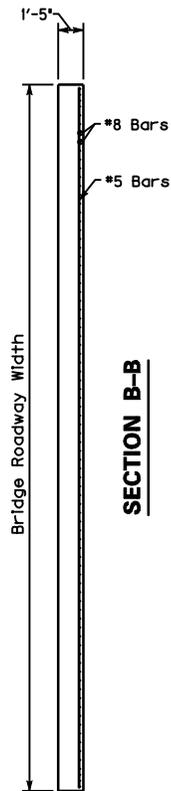
Deck Drain, see Std. Dwg. BDP-003



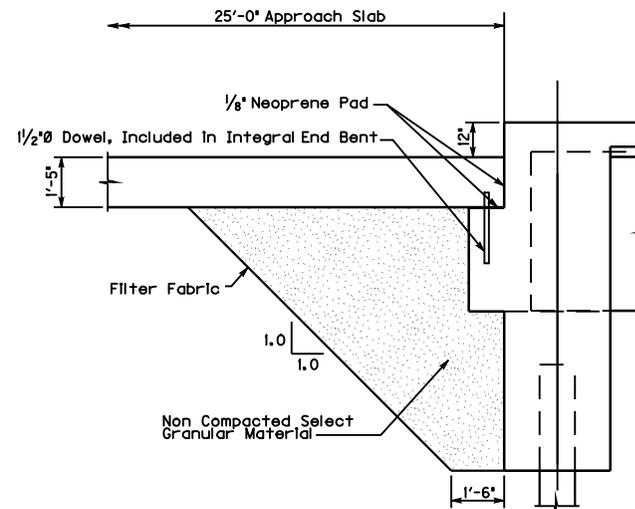
PLAN



SECTION A-A



SECTION B-B



TYPICAL SECTION @ BRIDGE END

GENERAL NOTES

CROWN: Crown shall conform to the rate of crown at the approach pavement and bridge deck. If the rate of crown at the bridge deck differs from that of approach pavement, a smooth transition shall be provided within the limits of the approach slab.

CONCRETE: Concrete shall be Class 'AA'.

REINFORCEMENT: All steel reinforcement shall be Grade 60 and epoxy coated.

PAYMENT: Include the cost of Class 'AA' Concrete, epoxy-coated steel reinforcement, and all labor and materials required to construct the approach slab in the bid item for Approach Slab.

KENTUCKY DEPARTMENT OF HIGHWAYS		
APPROACH SLAB		
STANDARD DRAWING NO. BGX-017		
SUBMITTED	<i>Frank</i> DIRECTOR DIVISION OF BRIDGE DESIGN	11-21-07 DATE
APPROVED	<i>N. [Signature]</i> STATE HIGHWAY ENGINEER	11-21-07 DATE

General Notes

SPECIFICATIONS: All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO Standard Specifications for Highway Bridges.

INSTALLATION PROCEDURE: Seal the ends of the joint seal to prevent the entrance of water and foreign material.

WELDING SPECIFICATIONS: Ensure techniques and welding procedure comply with current joint specification ANSI/AASHTO/AWS D1.5 Bridge Welding Code.

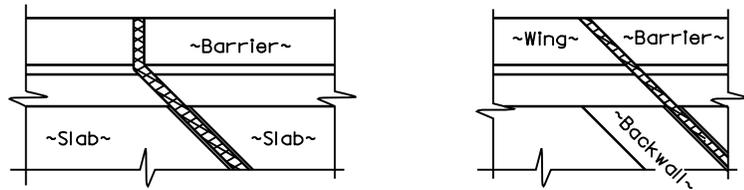
MATERIAL SPECIFICATIONS: Ensure steel material is new, commercial grade steel suitable for welding. Acceptance will be based on visual inspection by the Engineer. Joint sealing material, only, is in accordance with Section 807 of the Specifications. Ensure stud shear connectors conform to ASTM A108, Grade 1015.

LOCATION: Locate armored edges and/or expansion dams in accordance with detail plans.

PAINT: Clean and paint all structural steel in accordance with the Specifications, except that no field coating will be required.

SHOP DRAWINGS: Contrary to the Specifications, no shop plans are required.

BASIS OF PAYMENT: The accepted quantities of Neoprene Expansion Dam which includes the armored edges & preformed compression joint seal will be paid for at the contract unit price per linear foot for each size, measured along centerline of joint between the vertical faces of the barriers. When only an Armored Edge is required the cost of furnishing and placing the armored edge will be paid for at the contract unit price per linear foot, measured along the Armored Edge between the vertical faces of the barriers.

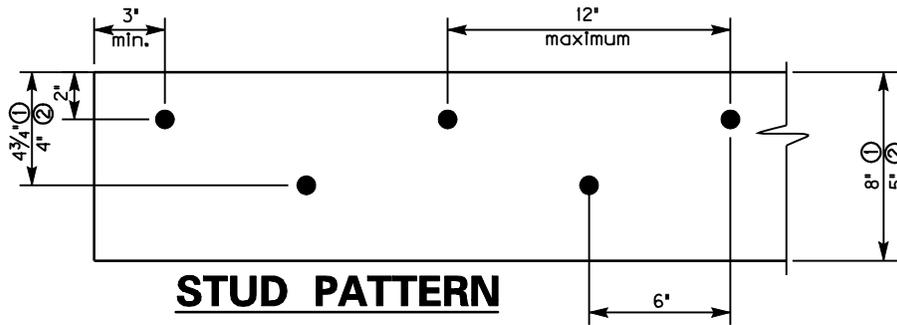


@ Piers or Bents

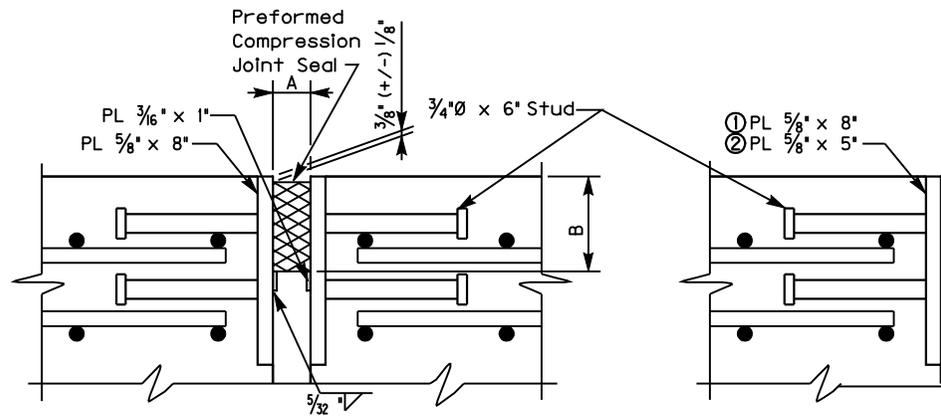
@ Backwall Substructures

TYPICAL BARRIER-JOINT TREATMENTS

Details are for skewed joints



STUD PATTERN



SECTION THROUGH JOINT

"A" - Minimum Joint opening @ 60°F
 "B" - Manufacturer's compressed seal height 1/4"

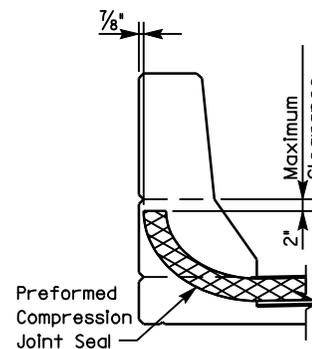
SECTION THROUGH ARMORED EDGE

- ① Assembly weight = 18.8 lbs./ft.
- ② Assembly weight = 12.4 lbs./ft.

Joint Data		The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement.
Dim. A @ 60°F (in)	Movement (in)	
1 1/2	1	
2	1 1/2	
2 1/2	2	

- ① Applies to 8" slab thickness
- ② Applies to 5" slab thickness

Temperature Change Increment per 10°F			
Concrete		Steel	
Span Length (ft)	Increment (in)	Span Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	3/32	101 - 140	3/32
201 - 260	1/8	141 - 180	1/8
261 - 320	5/32		



SECTION THROUGH BARRIER

KENTUCKY DEPARTMENT OF HIGHWAYS

NEOPRENE EXPANSION DAMS AND ARMORED EDGES

STANDARD DRAWING NO. BJE-001-II

SUBMITTED *W. Frank* 11-21-07
DIRECTOR DIVISION OF BRIDGE DESIGN DATE

APPROVED *[Signature]* 11-21-07
STATE HIGHWAY ENGINEER DATE